

Responding in the Homeland: A Snapshot of NATO's Readiness for CBRN Attacks

by Michael Moodie and Robert E. Armstrong with Tyler Merkeley

Overview

The possibility of North Atlantic Treaty Organization (NATO) members having to respond to a chemical, biological, radiological, or nuclear (CBRN) incident is not a hypothetical scenario reserved for training exercises. Indeed, a number of countries worldwide have considerable experience in dealing with a variety of naturally occurring, accidental, and deliberate CBRN incidents. NATO itself, however, has no clear conceptual vision of its role in civil emergencies because preparedness of this sort remains a national responsibility.

For many years, NATO's military forces have addressed CBRN issues as part of their military planning. But the question remains as to how NATO nations view the capability of their military forces and the contribution that these forces can make in dealing with the consequences of a domestic CBRN attack within one or several member countries. This paper provides insights into current thinking of NATO members—based on an informal survey of Alliance military attaches assigned to Washington, DC—regarding the planning, assets, and training for such a contingency.

The resulting snapshot of NATO CBRN capabilities suggests specific initiatives that should be considered within the Alliance to improve its collective response to a CBRN incident. Areas recommended for particular emphasis and further study include bolstering Alliance capabilities for biological and radiological contingencies; strengthening command and control and logistics capabilities; addressing the airlift shortfall; intensifying multi-lateral exercises; and creating an Alliance-wide mechanism for sharing lessons learned.

Terrorist bombings in Madrid and London, Hurricane Katrina, the tsunami in Southeast Asia, and the earthquake in Pakistan are all reminders of the importance of civil preparedness for domestic

emergencies, whether natural or manmade. In recent years, the North Atlantic Treaty Organization (NATO) has made civil emergency response a higher priority to reflect the changing role of the Alliance and to contribute to the transformation of its forces. A number of studies have made the point, however, that no single comprehensive approach to civil emergency response exists within NATO.¹ Civil emergency preparedness remains a national responsibility, and Alliance members have distinct domestic governance structures, face different risks, and experience diverse cultural influences in the way they conduct their national business.

One domestic contingency that has received considerable attention from NATO members is the risk of attack by terrorists using chemical, biological, radiological, or nuclear (CBRN) weapons. The occurrence of such events—whether accidental or deliberate—is certainly not hypothetical. The United States alone has experienced events that range from a partial reactor meltdown to anthrax attacks. Worldwide, there also is considerable experience with dealing with such crises.

One notable incident involved the release of anthrax (*Bacillus anthracis*) spores in 1979 in Sverdlovsk in the former Soviet Union. In that event, 96 people were hospitalized, 68 of whom died.² The Soviet government initially claimed that the deaths resulted from gastrointestinal anthrax caused by tainted meat. In 1992, with the collapse of the Soviet Union, President Boris Yeltsin confirmed what Western analysts had long suspected when he revealed that the incident was in fact caused by inhalation anthrax from an accidental spore release from a biological weapons facility.³

Also in 1979, the United States experienced its most serious radiological incident with the reactor accident at Three Mile Island in Pennsylvania. A failure in the nonnuclear part of the powerplant led to inadequate cooling and the melting of nuclear fuel pellets. Investigations by several well-respected organizations concluded that, despite serious damage to the reactor, most of the radiation had

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE JUN 2007		2. REPORT TYPE		3. DATES COVERED 00-00-2007 to 00-00-2007	
4. TITLE AND SUBTITLE Defense Horizons. Responding in the Homeland: A Snapshot of NATO's Readiness for CBRN Attacks. Number 56				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) National Defense University, Center for Technology and National Security Policy, Fort Lesley J. McNair, Washington, DC, 20319				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 6	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

been contained and that the actual release had negligible effects on the physical health of individuals and the environment.⁴ The cleanup of the damaged reactor, however, took nearly 12 years and cost almost a billion dollars.⁵

A less well-remembered incident took place in 1984. The Oregon-based Bhagwan Shri Rajneesh cult disseminated *Salmonella typhi* bacteria—causative agent of salmonella poisoning—in salad dressing at a restaurant in The Dalles, Oregon. The cult was attempting to keep voters away from the polls, where a measure hostile to the cult was on the ballot. In the end, they succeeded in sickening 751 local citizens but failed to block the measure.⁶ For more than a year, Oregon officials treated the incident as an unusual but natural outbreak.⁷ With the confession of a cult member, the responsible parties were arrested.⁸ This event is often cited as the first bioterrorism attack staged in the United States.

In 1986, Unit 4 of the nuclear power station at Chernobyl, Ukraine, in the former Soviet Union suffered an accident, resulting in the release of massive amounts of radiation into the environment. Thirty-one people died in the Chernobyl accident and its immediate aftermath. Most of the immediate casualties were suffered by firefighters.⁹ Estimates of the delayed health effects vary, but by 2002, 4,000 cases of thyroid cancer had been reported in exposed children. The cleanup costs at Chernobyl are estimated at \$1 billion.¹⁰ The aggregate damage from the catastrophe to the country has been estimated at \$235 billion (calculated for a 30-year recovery period).¹¹

In 1995, the Aum Shinrikyo cult conducted a nerve gas attack on the Tokyo subway. A dozen riders were killed and thousands injured.¹² The incident was actually five coordinated attacks on several subway lines during the rush hour commute. The terrorists used a low-tech approach of boarding the trains with two plastic half-liter bags of liquid sarin, which they punctured with an umbrella tip as they left the train. This incident illustrates the point that such attacks do not have to be conducted by tech-savvy individuals. The five simultaneous, separate attacks highlighted the pressures placed on emergency services during a CBRN attack and illustrated the need for better communication and coordination of emergency medical services.

The appearance of West Nile Virus—a mosquito-borne flavivirus—is a good reminder that Mother Nature is also capable of creating biological incidents. Although not a public health issue on the

scale of an anthrax release or a sarin attack, it is a useful case study in how quickly such organisms can spread across the country. First identified in New York City in 1999, the virus had spread across the United States by 2004. In 2006, there were 4,180 human cases of West Nile Virus in the United States, resulting in 149 fatalities.¹³

Of even greater public health significance was the 2002 outbreak of Severe Acute Respiratory Syndrome, a virus related to the common cold. First appearing in China and initially misdiagnosed as influenza or severe pneumonia—pointing out how newly emerging diseases can easily be allowed to “break out” from their initial cases—the virus ultimately resulted in 774 deaths worldwide and caused economic losses estimated at \$80 billion to \$100 billion.¹⁴

The dominant CBRN-related terrorist incident was the 2001 anthrax attack in the United States. Although the attack caused a relatively small burden of illness and death—22 infections and 5

deaths—it created significant political, economic, and social disruption. In the wake of the attack, as many as two million Americans might have taken antibiotics unnecessarily—a public health issue in and of itself.¹⁵ Additionally, the U.S. Government spent in excess of \$3 billion in direct costs to the U.S. Postal Service, as well as

more than \$24 million for the cleanup of the Hart Senate Office Building.¹⁶ The so-called Amerithrax attack highlighted significant shortfalls and challenges in the Federal biodefense response to an attack on the homeland—many of which remain unresolved 5 years later.

For most NATO members, the 2001 anthrax mailings in the United States transformed the CBRN threat from an interesting theoretical possibility to a real national security challenge. Continued reports of terrorist interest in CBRN capabilities and a number of disrupted plots that may have involved CBRN materials have kept the need for effective preparedness to deal with such a contingency well up on the list of priorities for most NATO members.

For many years, NATO military forces have addressed CBRN issues as part of military planning. Confronting battlefield use of such weapons, especially chemical and biological, is a contingency that NATO has had to address throughout most of its 60-year history. For this reason, NATO military forces have significant experience and expertise relevant to civil contingencies involving CBRN use. How do the NATO nations themselves view this capability within their military forces and its contribution to an effective response to a possible domestic CBRN attack in the homeland of one or more Alliance members?

To answer this question, the Center for Technology and National Security Policy (CTNSP) at the National Defense University distributed a questionnaire to the defense attaches of NATO member nations in Washington, DC, regarding their national capability for dealing with a CBRN attack. The questionnaire was designed to elicit views on the degree of planning, available national assets, and level of training of military and other national contingents for a CBRN attack in their homelands. Not all the questionnaires were answered, nor were complete answers always given in returned questionnaires. Nevertheless, the answers that were reported allow development of

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Summary of Selected Questionnaire Responses: NATO CBRN Assets by Geographic Region¹

Expertise	Northwest ² (percent)	Central ³ (percent)	Mediterranean/ Southeast ⁴ (percent)
Threat Identification			
Chemical	83	57	100
Biological	83	43	60
Radiological	67	43	80
Nuclear	67	43	100
Threat Decontamination			
Chemical	67	71	100
Biological	67	43	60
Radiological	50	57	80
Nuclear	67	57	80
Casualty Care			
Chemical	67	29	40
Biological	67	43	20
Radiological	67	14	20
Nuclear	67	29	0
Consequence Management			
Command and Control	50	29	40
Logistics	33	14	60
Dedicated CBRN Units⁵			
None	67	71	40
Company-size	0	14	40
Battalion-size	0	14	40
Other assets ⁶	33	14	20
Critical Equipment⁷			
Medicines	40	86	100
Protective equipment	40	86	90
Decontamination gear	40	57	90
Asset Deployability Outside of Homeland			
Self-sufficient	80	33	40
Require additional airlift	20	67	60
Require additional sealift	0	17	0
Require additional rail	0	17	0

¹ For the purposes of this geographical analysis, data submitted by the United States and United Kingdom were not considered. Figures represent percent of respondents having the indicated expertise/assets; six member states did not respond, accounting for only 15.5 percent of total NATO forces (active and reserves).

² Belgium, Denmark, France, Iceland, Luxembourg, Netherlands, Norway, Portugal, United Kingdom, and Spain.

³ Czech Republic, Estonia, Germany, Hungary, Latvia, Lithuania, Poland, and Slovakia.

⁴ Bulgaria, Greece, Italy, Romania, Slovenia, and Turkey.

⁵ Not all columns add to 100 percent; some respondents declared both company- and battalion-sized units.

⁶ Nonmilitary units such as fire brigades and national gendarmerie.

⁷ UK data were not considered in this particular calculation of northwestern NATO countries.

a snapshot of current thinking and practice regarding this domestic contingency of key importance to all Alliance members (see table).¹⁷

Following a preliminary discussion of current NATO efforts to address emergency responses and civil preparedness for CBRN contingencies, the results from the questionnaire are discussed in the remainder of this paper. Various “cuts” on the data seemed relevant, but the most useful proved to be a geographic assessment of the survey responses. This provided a better picture of where strengths and weaknesses existed in Alliance assets and capabilities. Thus, the analysis partitioned NATO’s European members into Northwest Europe, Central Europe, and Mediterranean/Southeastern Europe. (This cut does not include North American members—the United States and Canada—that were part of the survey.) The general observations offered here are subject to the limitations of this survey, but they do highlight some key issues that should be of interest to NATO and national leaders.

Background

Although civil emergency planning remains a national responsibility, NATO has made significant efforts to work the problem across the Alliance. The principal NATO body in the areas of civil preparedness, operating under the North Atlantic Council (NAC)—the main decisionmaking entity—is the Senior Civil Emergency Planning Committee (SCEPC), which is supported by the Civil Emergency Planning Directorate at NATO headquarters.

The NAC and SCEPC have adopted a series of agreements defining NATO’s role and instruments in civil emergencies. Agreements related to natural and manmade disasters include the NATO Policy on Disaster Assistance in Peacetime¹⁸ and the statement on Enhanced Practical Cooperation in the Field of International Disaster Relief.¹⁹ In the realm of terrorism and CBRN, the main document is the Civil Emergency Planning Action Plan, adopted at the 2002 Prague Summit, which calls for establishment of an inventory of national capabilities, development of interoperability for response services through exercises, and adoption of standard operating procedures.²⁰ The plan encourages adoption of border-crossing arrangements for relief teams, equipment, and supplies. It also suggests development of nonbinding guidelines or minimum standards in the areas of planning, training, and equipment for civilian response to CBRN attacks. In April 2005, the SCEPC also approved an Updated Action Plan for the Improvement of Civil Preparedness for possible CBRN terrorist attacks. The plan encompasses a variety of measures to improve the preparedness of individual allies, as well as NATO as a whole, with particular emphasis on disaster response coordination, protection of critical infrastructure, and support to victims of an attack.

The operational entities for NATO’s involvement in civil emergencies are the Euro-Atlantic Disaster Response Coordination Center (EADRCC) and the Euro-Atlantic Disaster Response Unit (EADRU). The EADRCC, headed by NATO’s Director of Civil Emergency Planning, is a small entity with four functional desks for situations, assistance, transportation, and general policy. Its main responsibilities are coordinating national responses and serving as a focal point for information-sharing and assistance requests. During Hurricane Katrina, the EADRCC coordinated responses to a U.S. relief request from 39 NATO and partner countries, including provision of food, water, medical supplies, tents, and other necessities. Between September 12 and October 2, 2005, 12 NATO flights delivered almost 189 tons of

relief goods to the United States.²¹ The EADRU is a multinational mix of civilian and military elements volunteered by NATO and partner countries for deployment in case of a major disaster. Its elements can include qualified rescue personnel, medical supplies and equipment, temporary housing, water sanitation equipment, and airlift.

NATO has undertaken a number of initiatives aimed at improving Alliance military capabilities for the fight against CBRN terrorism that could also contribute to civil protection. The two most important are the NATO Response Force (NRF) and the NATO CBRN Defense Battalion. The Katrina relief effort was the first deployment of the NRF. In October 2005, the NRF also deployed to assist in the earthquake relief efforts in Pakistan, where it coordinated all NATO land and air operations, such as transport of supplies, evacuations, medical assistance, and engineering support. The battalion's main mission is to provide the Alliance with a rapidly deployable and efficient response capability in the event of a CBRN attack against NATO forces, but it can also be used to support civil authorities, as it was during the 2004 Summer Olympics in Athens. The 2002 Prague Summit further approved five CBRN defense initiatives with CBRN implications for civil emergencies, including development of a deployable CBRN analytical laboratory, CBRN event response team, virtual center of excellence for CBRN weapons defenses, biological and chemical defense stockpile, and disease surveillance system.²²

Despite these advances at the Alliance level, civil emergency preparedness is a national responsibility. As a result, a conceptual vision of NATO's role in civil emergencies remains undefined and without common agreement, leaving preparedness efforts subject to competing views of what is appropriate for NATO to do. The EADRU and EADRU, for example, are used to coordinate only if called on to do so. In no sense are their roles conceived to give direction to any NATO member. Whether at the Alliance or the national level, the ability of Alliance members to respond effectively to a CBRN attack will depend on the quality of national assets and, increasingly, their ability to work together. The following section presents a snapshot of the perspective of NATO allies on the status of this vital capability.

Preparedness: A Snapshot

Planning. NATO members that answered the CTNSP questionnaire were nearly unanimous in indicating that they have national response plans for civil emergencies and that civil authorities would lead consequence management efforts in the event of a CBRN attack. A significant majority of respondents indicated that their national military forces have contingency plans to respond to such attacks. In most cases, however, military forces would be utilized after the initial response, which would be handled by civilian agencies. In the plurality of cases, military forces were described as "second responders" (especially in Central Europe). Several countries suggested that their designated forces would serve as either second or third responders. Only two countries reported that their forces would act as first responders; a few others suggested their military forces could act in

this role, if necessary. In the U.S. case, military forces generally are scheduled to serve as third responders, although some identification and detection units are envisioned to arrive on the scene early.

In the event of a CBRN attack in their homelands, almost all national plans of NATO members include the possibility of requesting support from other nations (two Central European allies indicated they did not have such plans). The majority of answers pointed out that these countries will accept assistance from any country that offers, although some noted that this was not official policy, but the practice in reality. In some cases, countries also reserve the right to refuse offers of assistance. One responder indicated it would accept assistance only from other NATO members.

Assets. NATO members reported a wide range of capabilities when surveyed on the assets they could bring to bear in the event of a CBRN attack. The listed options of possible assets included identification, decontamination, and casualty care for each of the CBRN contingencies, as well as command and control in consequence management and logistical support. Three countries (the United States and two in northwestern Europe) indicated that they had all of the identified capabilities; only one nation (in Central Europe) indicated that it had none. All other countries reported some combination of capabilities. In most cases, answers indicated that these capabilities reside in a combination of military and civilian agencies (with Mediterranean/Southeastern European countries virtually unanimous in this regard).

Despite the wide diversity in reported assets, the majority of capabilities appear to relate primarily to detection/identification and decontamination functions. Casualty care assets are reported significantly less often. The reporting also suggests that NATO members tend to be especially short on command and control and logistics capabilities. Responses make it difficult to determine whether these capabilities relate more to chemical, radiological, or nuclear contingencies. What is clear, however, is that capabilities appear to be particularly limited with respect to a biological contingency.

In terms of specially trained military units that could be used in the event of a CBRN attack, only one country (in Central Europe) indicated it did not have such units. Of those countries answering positively, about half reported that their largest such units were battalion-size; slightly less than half described their largest such units as company-size. In contrast, the United States has organized brigade-size units for the CBRN response mission. Approximately two-thirds of the respondents pointed out that their ministries of defense (MODs) did not have other possible CBRN response units (for example, fire brigades, national gendarmerie) under their control. The one-third that did indicate their MODs controlled additional assets reported battalion- or company-size units.

Almost all respondents indicated that other assets in the civilian sector not under MOD control would be involved in responding to a CBRN attack. These assets include some combination of command and control, medical care, communications, and logistics, with about 60 percent of the respondents reporting assets in each category. Not surprisingly, medical care assets were virtually unanimously identified.

Similarly, when asked whether the nation maintains a stockpile of critical material and/or equipment specifically dedicated for use in the event of a CBRN attack—stocks of medicines, protective equipment, and decontamination gear—most Mediterranean/Southeastern European states checked all the boxes, while only about a third of those members in northwestern and Central Europe did so. Almost all respondents indicated that they held stocks of medicines. Protective and decontamination equipment was reported in slightly fewer answers.

Most respondents suggested that they might be able to provide assistance to another ally if requested. When asked what kind of aid they could provide, options included specialized decontamination personnel and equipment, communications, logistics, and medical support. Four countries—the United States and three in northwestern Europe—could, in their view, provide help in all categories. For the other respondents, potential assistance on offer related primarily to decontamination equipment and medical support. Other than the five countries that could possibly offer all categories of assistance, only two countries indicated they could offer logistics support, and none indicated communications support was available.

No other significant findings regarding regional differences were discernable.

One area in which there was considerable shortfall was the deployability of assets to other regions of the Alliance. Almost half of the overall respondents noted that they would need additional airlift if they were to deploy outside their borders. (This was especially true for Alliance members in the Mediterranean/Southeastern Europe and the small Central European members.) This is an area in which the United States could play a significant role, given its considerable airlift assets. The United States might be called on, therefore, to lift not only its own national assets in support of a response to an attack on an ally in Europe, but other nations' assets as well.

Training. A significant majority of respondents consider their forces that would respond to a CBRN event to be well trained. The quality of training reflects the amount of time devoted to training. Most units with a dedicated CBRN mission commit 50 to 100 percent of their time to training for that mission.

Much of the training appears to be conducted jointly with civilian units responsible for consequence management of CBRN events. Almost all respondents reported such joint training. Although one country noted monthly joint training between civilian and military units, and another noted quarterly joint training, most answers indicate military-civilian training is conducted semi-annually.

Respondents were almost equally divided between those who train with other NATO allies and those who do not. For those who do, the joint training mechanisms utilized are split between countries that include allies in the full range of training activities—from command post observers to observers with units or allied units integrated into the exercise—and those that report only integrating allied units into their exercises. One country noted its training with allies is undertaken as part of NATO's nuclear, biological, and chemical battalion.

A significant majority of NATO members also point out that they have a mechanism for sharing lessons learned. These mechanisms,

however, tend to be national in operation, with some allies sharing at the national level either with other agencies that also have CBRN responsibilities or, in some cases, with others at the national level of government generally. A few countries, including the United States, also share lessons learned with authorities at the local level. Little sharing of lessons learned among allies, however, was reported: Only about 20 percent of those nations who said they do share lessons (and only about 16 percent of the total respondents) indicated they share with allies.

Recommendations

The responses to the CTNSP questionnaire provide a relatively optimistic picture. Nevertheless, in comments to NATO's Senior Civil Emergency Planning Committee in November 2006, Federal Emergency Management Agency director R. David Paulison made the following observation: "In NATO, I see an extraordinarily valuable emergency management capability that is being underutilized. I believe that this is due to the lack of civil-military cooperation, coordination, and planning at NATO. We need to plan together. We need to train together. We need to exercise together. So that we can respond together."²³

Even this limited assessment identifies a number of gaps and shortfalls. As a result, NATO should consider the following recommendations:

CBRN contingencies could well have impacts across national borders, so response effectiveness could depend on allies working together

Conduct a formal survey of Alliance capabilities. The Senior Civil Emergency Planning Committee should produce a report on NATO CBRN response capabilities for consideration at the Spring 2008 Bucharest Summit based on a formal survey of NATO members. The survey and report are essential first steps

in an effort to establish the best possible NATO response posture in the event of a CBRN attack. The informal survey summarized above establishes that not only capabilities exist, but also gaps. Critical gaps must be filled, and existing capabilities will serve the Alliance better with appropriate advance organization, which can be addressed by the report.

Bolster Alliance capabilities for biological and radiological contingencies. Responses to the questionnaire did not identify much in the way of Alliance assets for responding to biological or radiological attacks. NATO nations, individually and collectively, should conduct a comprehensive assessment of the entire spectrum of necessary biological- and radiological-related capabilities to identify shortfalls and develop a strategy for determining priority investments to address them. With the possibility of a naturally occurring flu pandemic, this is an especially important point to address.

Strengthen command and control and logistics capabilities. A striking shortfall identified in the responses to the questionnaire was the lack of command and control and logistics assets, which represent notable shortcomings in terms of assets that might be shared with allies. While some command and control and logistics assets for CBRN consequence management certainly reside in the civilian sector, the limitations in these areas could represent serious bottlenecks that would badly impair NATO CBRN consequence management efforts.

Address the airlift shortfall. CBRN contingencies could well have impacts across national borders, so response effectiveness could depend on allies working together. While NATO members have resources that they are willing to share, the identified lack of airlift could create problems in ensuring a timely response to requests for assistance.

Intensify multilateral exercises. Because emergency response remains a national responsibility, most NATO members conduct national-level exercises. Although NATO nations do exercise together, it is often on an ad hoc basis, and the exercises frequently are limited in scope. NATO should review the exercise plans of members for addressing CBRN contingencies and determine if they are sufficient in terms of numbers of exercises and participation.

Create a NATO-wide mechanism for sharing lessons learned. An Alliance-wide mechanism for sharing lessons learned and best practices would be an important planning asset. Possible models for such a mechanism could be either the Center for Army Lessons Learned, developed by the U.S. Army, or the electronic Lessons Learned Information System, created for the U.S. Department of Homeland Security by the U.S. Memorial Institute for the Prevention of Terrorism as a means for sharing detailed lessons and best practices among first responders across the United States.

With NATO's role continuing to develop in the fight against terrorism, and with the potential for naturally occurring, accidental, and deliberate CBRN incidents likely to increase, it is prudent to consider further examination of these points. Some problems may be fixed easily using current assets, while some may require considerable discussion and compromise among Alliance members. Nonetheless, the earlier that these issues are addressed, the sooner the Alliance will be in a position to respond adequately to the needs of its members in the event of a CBRN incident.

Notes

¹ See, for example, Lord Jopling, Rapporteur, "NATO and Civil Protection," Committee on Civil Dimension of Security, NATO Parliamentary Assembly, Report 166 CDS 06 E, October 3, 2006, 5.

² Suburban Emergency Management Project, "1979 Sverdlovsk Human Anthrax Epidemic: Perspectives of Victims and Health Workers," SEMP Biot #324, January 22, 2006, accessed at <www.semp.us/biots/biot_324.html>.

³ Robert A. Wampler and Thomas S. Blanton, "U.S. Intelligence on the Deadliest Modern Outbreak," National Security Archive Electronic Briefing Book No. 61, November 15, 2001, accessed at <www.gwu.edu/~nsarchiv/NSAEBB/NSAEBB61/>.

⁴ United States Nuclear Regulatory Commission, "Fact Sheet on Three Mile Island Accident," March 2004, accessed at <www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html>.

⁵ Uranium Information Centre, "Three Mile Island: 1979, Nuclear Briefing Paper 48," March 2001, accessed at <www.uic.com.au/nip48.htm>.

⁶ Raymond A. Zilinskas, *Biological Attacks: Lessons of September and October 2001*, Center for Nonproliferation Studies, Monterey Institute of International Studies, December 12, 2002, accessed at <www.frstrategie.org/barreFRS/publications_colloques/colloques/20021212/20021212-4.doc>.

⁷ Seth W. Carus, testimony before the Senate Committee on the Judiciary, March 4, 1998. See also Seth W. Carus, "The Rajneeshis (1984)," in *Toxic Terror: Assessing Terrorist Use of Chemical and Biological Weapons*, ed. Jonathan Tucker (Cambridge: MIT Press, 2000), 128.

⁸ Bruce Hope, *Systematic Identification of Research Gaps for Food and Water-borne Pathogens*, Oregon Department of Environmental Quality, interview, Baltimore, MD, March 10, 2004.

⁹ United States Nuclear Regulatory Commission, "Fact Sheet on the Accident at the Chernobyl Nuclear Power Plant," December 2000, accessed at <www.nrc.gov/reading-rm/doc-collections/fact-sheets/fschernobyl.html>.

¹⁰ German Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety, "Federal Government Provides Further Funding for Clean Up Work in Chernobyl," December 29, 2005, accessed at <www.bmu.de/english/nuclear_safety/press_statements_speeches/pm/pdf/36498.pdf>.

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¹² Kyle B. Olson, "Special Issue: Aum Shinrikyo: Once and Future Threat?" July 1, 1999, accessed at <www.cdc.gov/ncidod/EID/vol5no4/olson.htm>.

¹³ Centers for Disease Control, Statistics, Surveillance, and Control, "2006 West Nile Virus Activity in United States," January 3, 2007, accessed at <www.cdc.gov/ncidod/dvbid/westnile/surv&control.htm>.

¹⁴ World Health Organization, Epidemic and Pandemic Alert and Response, "Summary of probable SARS cases with onset of illness from November 1, 2002 to July 31, 2003," September 26, 2003, accessed at <www.who.int/csr/sars/country/table2003_09_23/en/>.

¹⁵ Robert J. Blendon et al., Harvard School of Public Health/Robert Wood Johnson Foundation Survey Project on "Americans' Response to Biological Terrorism" Tabulation Report (Media, PA: International Communications Research, October 24–28, 2001), 5.

¹⁶ David Heyman, "Lessons from the Anthrax Attacks: Implications for U.S. Bioterrorism Preparedness, A Report on a National Forum on Biodefense" (Washington, DC: Center for Strategic and International Studies, April 2002), vii, accessed at <www.fas.org/irp/threat/cbw/dtra02.pdf>.

¹⁷ Six NATO member nations did not respond to the CTNSP questionnaire. According to data provided by the International Institute for Strategic Studies (IISS) in its annual *Military Balance*, these six nations accounted for only 10 percent of NATO's active forces and 15.5 percent of NATO forces overall (active and reserve). See IISS, *The Military Balance 2006* (London: Routledge, 2006). A complete copy of the questionnaire and data analysis can be obtained by emailing a request to lifesciences@ndu.edu.

¹⁸ See <www.nato.int/docu/logi-en/logist97.htm>. See also NATO's *Role in Disaster Response* (Brussels: NATO, November 2001), 18–19.

¹⁹ For a NATO Fact Sheet, see <www.nato.int/eadrcc/fact.htm>.

²⁰ The plan does not appear to be available publicly. For the Prague Summit Declaration language, see <www.nato.int/docu/pr/2002/p02-127e.htm>, para 4(e).

²¹ Lord Jopling, "NATO and Civil Protection."

²² Prague Summit Declaration.

²³ Federal Emergency Management Agency, "Director Paulison Speaks to NATO on the Importance of Civil-Military Cooperation," press release, November 16, 2006.

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